

## Homing In: On Arguing for Remote Representations\*

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Eliminate all other factors, and the  
one which remains must be the truth.

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How often have I said to you that when  
you have eliminated the impossible,  
whatever remains, however improbable,  
must be the truth.

--Sherlock Holmes to Watson in The Sign of the Four

### 0. Introduction

Linguistic analysis possesses both an 'arbitrary' and a 'natural' component--on the one hand, methodological principles and various means of organizing and handling data; on the other, empirical studies aimed at exposing linguistic universals through the detailed analysis of specific languages, cross-linguistic comparison, phonetic studies, psycholinguistic experiments, observation of language acquisition, and other sources of pertinent data. In practice, the arbitrary and natural components are intertwined, and each makes use of methods and results from outside linguistics in a narrow sense: the arbitrary component contains many principles and methods which are not peculiar to linguistics at all, but are rather the common property of scientific investigation, while the natural component refers ultimately to aspects of mental and social organization and physical properties of the vocal tract, many of which are independent of specifically linguistic behaviors and abilities.

My concern here is with an aspect of the arbitrary component, one shared with other enterprises in which methods of problem solving are brought to bear on empirical data. What is characteristic about homing in is that facts are viewed as a kind of puzzle, obscuring the real elements and relationships; the function of the analyst is to determine what these remote entities are by eliminating possibilities so as to fix upon, or 'home in on', the right answer. Typically, this process involves assembling facts in such a way that one can solve for the answer. In sciences of quantity, the answer is obtained by using a bag of tricks to set up an equation, which is then solved. In linguistics, the analyst makes a list of conditions, and the answer is taken to be the simplest entity satisfying them.

The method is familiar from contrived logical puzzles of the 'A, B, and C are a bank clerk, tightrope walker, and drug smuggler, though not necessarily respectively' variety, which Wylie (1957: intro.) takes to 'epitomize the entire scientific process' and in which 'the answer is ultimately wrested from the seemingly incoherent information initially provided'.

In what follows I examine some argumentation using homing in from The Sound Pattern of English<sup>1</sup> (section 1), which I take to be impeccable in structure, even though it results in an indefensible analysis. This I contrast with a structurally similar case from Sanskrit (section 2), in which the method of homing in is supported at each stage by empirical evidence. I close with some discussion of homing in in syntax (section 3) and a brief assessment of the value of the method (section 4).

# 1. The SPE treatment of ɔj

SPE treats many choice problems, in which the analysis selects as underlying a segment that is actually in alternation; a typical case is the argument that /k/ underlies the alternation [k] in electric ~ [s] in electricity ~ [s] in electrician (SPE, 168, 219, 224-327). More complex are alternations for which it is argued that the underlying representation is distinct from all of its surface realizations, as when Chomsky and Halle claim that the second vowel in divine and divinity is underlyingly neither a j nor I, but rather /ɪ/ (SPE, 178-86) and that the second consonant in right and righteous is underlyingly neither simple t nor the affricate c, but rather the cluster /xt/ (SPE, 223-4). These are homing in arguments.

Consider now the surface diphthong [ɔj]. The SPE discussion (191-2) of this phonological element proceeds through nine steps:

- (a) It is observed that one consequence of the analyses up to this point in SPE is that VG sequences have been eliminated from the lexicon (in favor of tense vowels affected by Vowel Shift and Diphthongization);
- (b) We then see if we can remove this exception by taking it to be some underlying X which is converted to the surface diphthong [ɔj]; if possible, this conversion should be effected by independently motivated rules, to as not to add rules for this special case.
- (c) Note that the existing Diphthongization rule inserts a glide after a tense vowel; j is inserted after a nonback vowel. To take advantage of this rule, we assume that X is a tense nonback vowel.
- (d) ɔj is low and round. Apparently, if X were nonlow or nonround, we would need special rules to generate the right features. Consequently, take X to be low and round.
- (e) Putting these observations together, we see that X has been specified for all the relevant features: it is a tense, nonback, low, round vowel--that is  $\bar{a}$ .
- (f) As a result, we need a  $\bar{a} \rightarrow \bar{o}$  rule. But there is already a Backness Adjustment taking  $\bar{a} \rightarrow \bar{a}$  / \_\_ j. This rule can now be made more general.

(g) Consider next the effect of adding /æ/ to the inventory of underlying segments. SPE claims that it fills a 'gap' in the set of tense low vowels, which otherwise are /ā ā ɔ/.

(h) Next we must see how the new segment would be treated by existing rules. First, there is the Vowel Shift, which affects tense vowels. However, to prevent ā from being shifted, SPE restricts the rule to [aback, around] vowels; consequently æ is conveniently exempted as well.

(i) Nevertheless, æ must be marked as an exception to at least one rule, Laxing before two following syllables, because surface [ɔj] occurs in words like exploitative. This is the price we must pay for the analysis.

It is striking how little 'empirical input' this argument has. Its original motivation is to simplify underlying morpheme structure (and even this step depends upon how well supported other arguments eliminating underlying diphthongs are); we determine the identity of X by considering how to use existing rules to the fullest and how to avoid positing new rules; a new rule that is required is justified on the ground that it is a generalization of an existing rule; the new segment is justified on the ground that it fills a distributional gap; its failure to undergo Vowel Shift is said to follow from its being a member of a natural class with ā; its failure to lax is, reluctantly, admitted to be exceptional (though presumably outweighed by all the other considerations). There are no morphophonemic alternations to be explained here, no facultative variation, no universal constraints on systems, not even slips of the tongue or stages in acquisition. The entire argument is formal.

Even as they stand, the steps of the argument are subject to criticism. Step (a) depends upon previous arguments against underlying diphthongs; these in turn have been widely attacked. Against step (b), we could claim that underlying form is identical to surface form, unless there are cogent reasons for saying otherwise; a somewhat unusual underlying sequence would scarcely count, since there must be borrowings, exceptions, and the like anyway. Steps (c) through (e) home in on X, using existing rules and features; but there is no inherent advantage in taking a free ride on existing rules. The generalization in step (f) may be spurious. The gap in step (g) certainly is, since the occurrence of a low front rounded vowel in a language seems to depend not at all on what other low vowels occur, but rather on what other front rounded vowels occur (briefly, to have a low front unrounded vowel a language must have mid or high front unrounded vowels); the system SPE argues for is quite unnatural. Step (h) treats ā and æ as a natural class, an unlikely claim, it seems to me; certainly I know of no parallels. Even step (i) creates some difficulties, because although [ɔj] doesn't undergo trisyllabic laxing, there are examples in which it appears to have been affected by the other laxing environment in English, before two consonants: destruction, puncture, and juncture (presumably related to destroy, point, and join, respectively). Here a remote representation ū is suggested by the alternation with ʌ (compare profound/profundity for which SPE has /ū/). Other possibilities are

simply /ɔj/, using the principle that underlying forms shouldn't differ from surface forms without reason (Vennemann 1971); /ȳ/, if we try to apply the same arguments as SPE but attend to the generalization that a language has nonhigh front rounded vowels only if it has high front rounded vowels; /ʌ/, suggested by the few actual alternations and by general constraints on phonological systems (Hoard 1973); or even a front rounded vowel that is both low and high, as postulated by Krohn (1972).

In any event, each stage of the SPE analysis rests entirely upon considerations of systematic simplicity. At the same time it illustrates quite nicely a style of argument in which we are to assume that there is some unknown X and that the features of X can be determined, step by step, from the conditions it must satisfy.

## 2. Sanskrit roots in ks

I now take up the case of the internal sandhi of Classical Sanskrit roots ending in ks.<sup>2</sup> As in the previous section, I will present arguments that the underlying representation is distinct from any of its surface realizations and will home in on this underlying form. In contrast to the example from SPE, the Sanskrit argument depends upon empirical input at several points. In fact, the argument begins with morphophonemic alternations to be explained, rather than the asymmetrical underlying system that motivated the SPE analysis.

### 2.1. Roots in ś and ṣ

To show this, I must first present important background facts about Sanskrit morphophonemics, in particular the internal sandhi of root-final ś and ṣ, as summarized in Table 1.3

Table 1.

Internal sandhi of ś and ṣ

	<u>dviṣ-</u> 'hate'	<u>dāṣ-</u> 'make offering'	ENDING
PRESENT INDICATIVE:			
(a) 1 sg. act.	dvésmi	dāṣmi	+mi
1 du. act.	dviṣvās	dāṣvās	+vas
1 sg. midd.	dviṣé	dāṣé	+e
(b) 3 sg. act.	dvéṣti	dāṣti	+ti
2 du. act.	dviṣthās	dāṣthās	+thas
(c) 2 pl. midd.	dviṣḍhvé	dāṣḍhvó	+dhve
(d) 2 sg. act.	dvéksi	dāksi	+si
ROOT NOUN:			
(e) nom. sg.	dvīt	dāt	(+s)
loc. pl.	dviṣú	dāṣú	#su
inst. pl.	dviṣbhís	dāḍbhís	#bbhis

In the (a) forms in the table--that is, before endings beginning with sonorants<sup>4</sup>--we see  $\dot{s}$  and  $\dot{s}$ , which I take to be the underlying segments (because position before sonorants is the position where there are the most contrasts, and because there are no obvious explanations for the segments that appear there, so that there is no reason to suppose that the underlying segments are not the same as the surface ones).

The (b) and (c) forms show a retroflex consonant before endings beginning with a stop; this consonant is a spirant before a voiceless ending, a stop before a voiced ending. These examples also illustrate the operation of two general rules of Sanskrit, a (word-internal) Progressive Retroflexion Assimilation in (b) and a Regressive Voicing Assimilation (applicable in both internal and external sandhi) in (c). In (d), before  $\dot{s}$ , both spirants appear as  $k$ , and a general rule of  $\dot{s}$ -Retroflexion applies to the initial  $\dot{s}$  of the ending. Finally, the forms of the root noun in (e) show that in word-final position both spirants are realized as retroflex stops; the nominative singular ending  $\dot{s}$  is deleted by an early (independently motivated) rule of Cluster Simplification, and the two other endings behave in general as if they occurred with a boundary stronger than  $+$  (note, for example, the failure of Progressive Retroflexion Assimilation in the locative plural). I therefore assume that the relevant context for (e) is : before the boundary  $\#$ .

The analysis exposed thus far is outlined in Table 2. Cluster Simplification, in (a), applies before the Spirant Shifts, in (b). For the moment, I have not formulated the Spirant Shifts as rules; instead, I give the outputs and their environments. List (c) contains other rules that apply in the derivation of the forms in Table 1; all of these are independently motivated.

Table 2.

Rules exemplified in Table 1.

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(a) Cluster Simplification

(b) Spirant Shifts

$$\begin{array}{l} \dot{s} / \text{---} \left[ \begin{array}{l} +\text{obst} \\ -\text{cont} \\ -\text{vcd} \end{array} \right] \\ \dot{t} / \text{---} \left\{ \left[ \begin{array}{l} +\text{obst} \\ -\text{cont} \\ +\text{vcd} \end{array} \right] \right\} \\ k / \text{---} \left[ \begin{array}{l} +\text{obst} \\ +\text{cont} \end{array} \right] \end{array}$$

(c) Progressive Retroflexion Assimilation  
 Regressive Voicing Assimilation  
 $\dot{s}$ -Retroflexion

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The problem of formulating the Spirant Shifts does not affect the subsequent discussion in any significant way. For definiteness, we may consider the process as involving three rules. Rule (A) shifts  $\text{ṣ}$  to  $\text{ś}$  before continuants, and  $\text{ś}$  to  $\text{ṣ}$  before stops and  $\#$ . Rule (B) then takes  $\text{ś}$  to  $\text{k}$  before continuants, while (C) takes  $\text{ṣ}$  to  $\text{ṭ}$  before voiced stops and  $\#$ .<sup>5</sup> The feature composition of these rules is not relevant here.

## 2.2. Roots in $\text{kṣ}$ .

Table 3 gives forms for the root caks- 'see' corresponding to the forms in Table 1. The (a) cases again show the root-final element unchanged, and the remaining cases show exactly the same alternants as the roots in  $\text{ṣ}$  and  $\text{ś}$ . We now seek an explanation of why the cluster  $\text{kṣ}$  should behave in just the same way as the simple spirants.<sup>6</sup>

One possible account would be to say that there is a k-dropping rule, roughly of the form

$$k \rightarrow \emptyset / \text{---} \left[ \begin{array}{l} +\text{obst} \\ +\text{cont} \end{array} \right] \left\{ \begin{array}{l} [+ \text{obst}] \\ \# \end{array} \right\}$$

ordered before the spirant shifts. Such an analysis would cover the facts, but at the cost of an additional rule, one without independent motivation.

Table 3

Internal sandhi of  $\text{kṣ}$ .

	<u>caks-</u> 'see'	ENDING
PRESENT INDICATIVE:		
(a) 1 sg. act.	cākṣmi	+mi
1 du. act.	cakṣvās	+vas
1 sg. midd.	cakṣé	+e
(b) 3 sg. act.	cāṣṭi	+ti
2 du. act.	caṣṭhās	+thas
(c) 2 pl. midd.	caḍḍhvé	+dve
(d) 2 sg. act.	cākṣi	+si
ROOT NOUN:		
(e) nom. sg.	cāt	(+s)
loc. pl.	caṭṣú	#su
inst. pl.	caḍḍhís	#bhís

Moreover, k-dropping would have to precede Cluster Simplification, since otherwise the nominative singular of cakṣ- would come out cak instead of the correct cāt. This is a somewhat peculiar consequence of the analysis, because Cluster Simplification otherwise appears to apply before all other phonological rules in Sanskrit. In fact, the

k-Dropping solution leads to an ordering paradox, if s-Retroflexion is to be used to explain the fact that there are no Sanskrit roots ending in ks, only in kṣ. That is, if the final ṣ in cakṣ- and similar roots is derived from s by the s-Retroflexion rule, then s-Retroflexion must both precede k-Dropping (so that underlying caks will yield cakṣ and then caṣ, rather than the incorrect cas) and follow it (k-Dropping precedes the Spirant Shifts, and these must precede s-Retroflexion because they create some occurrences of k that trigger retroflexion, as in 2 sg. act. cākṣi).

The ordering paradox is apparently eliminable by reference to general principles of rule application: s-Retroflexion applies before k-Dropping so that both rules will have the opportunity to apply, and then s-Retroflexion applies again when new occurrences of k are created. Perhaps such principles could be appealed to for an explanation of why k-Dropping precedes Cluster Simplification; although the two rules bleed each other and both yield opaque outputs, k-Dropping leads to forms (e.g. caṣ) to which other rules are applicable, whereas Cluster Simplification doesn't feed other rules.

In any event, the k-Dropping solution is not without problems of its own, aside from involving a new rule.

Now just as SPE attempted to find an underlying representation for oḡ so as to avoid VG sequences in the lexicon, we attempt to find an underlying representation for kṣ so as to avoid adding a special rule. First, this X must reduce to ṭ before #. There are only four segments--ṣ, ś, ṭ, and ḍ--that yield ṭ in this position by existing rules of Sanskrit, so that one of these four must be an intermediate stage between underlying X and surface ṭ.

Next, X must become kṣ before sonorants. Again, given the rules presented so far, there are only four possible sources of kṣ in this position: śś, śs, ss, and ss. Before # any one of these would give ṣ or ś as an intermediate stage leading to ṭ.

Of the four clusters, the first three contain ṣ in a position where retroflexion is not in general predictable. Consequently, if we try to minimize features in the lexicon, the cluster śś is the best candidate for X. Underlying caśś+mi would give cakṣ+mi by the Spirant Shifts and cakṣ+mi by s-Retroflexion; underlying caśś#su would give caṣ#su by Cluster Simplification and then caṭ#su by the Spirant Shifts.

Thus far, we have homed in on the underlying cluster śś. But just as Chomsky and Halle had apparently to add a  $\bar{a} \rightarrow \bar{a}$  rule, given their solution for X, so we appear to have to add a rule, given our solution. The problem arises in the remaining environments for the kṣ roots, namely before obstruents. Here we have medial clusters like śś+t, śś+d, and śś+s, which would yield kṣ+ṭ, kṣ+d, and kṣ+s with our present rules. Since the correct results are the same as those deriving from the medial clusters ś+t, ś+d, and ś+s, it seems that we need a special rule deleting s between ś and an obstruent. SPE argued that the special Backness Adjustment rule was in fact merely a generalization of an existing rule for ā. Similarly (but with greater justification) I claim that s-Deletion isn't new or special at all: it is a well-known rule of Sanskrit, a general deletion of s between two obstruents,

illustrated in Table 4 by the active voice forms of the s-aorist. The entire conjugation of nī-, and the 1 dual and plural forms for chid- and tap-, have the structure

( ( a + MODIFIED ROOT + s ) + ENDING )

but the remaining four examples have no s. It is just roots ending in obstruents, and then only when preceding endings like -tam, -tām, and -ta, which begin with an obstruent, that lack the s; these forms are boxed in Table 4. Since Sanskrit already needs s-Deletion, it is no surprise that medial clusters of ss plus an obstruent are treated the same way as s plus an obstruent. It is just what we should expect.

Table 4.

Active s-aorist forms.

		<u>nī-</u> 'lead'	<u>chid-</u> 'cut off'	<u>tap-</u> 'heat'	ENDING
(a)	1 du.	anā <sup>i</sup> ṣva	acchā <sup>i</sup> tsva	atāpsva	-va
	1 pl.	anā <sup>i</sup> ṣma	acchā <sup>i</sup> tsma	atāpsma	-ma
(b)	2 du.	anā <sup>i</sup> ṣtam	acchā <sup>i</sup> ttam	atāptam	-tam
	3 du.	anā <sup>i</sup> ṣtām	acchā <sup>i</sup> ttām	atāptām	-tām
	2 pl.	anā <sup>i</sup> ṣta	acchā <sup>i</sup> tta	atāpta	-ta

This completes the arguments for ss as a remote representation for root-final ks. The observed alternations have been explained without any additional rule apparatus. At this point in their treatment of oj Chomsky and Halle consider whether the underlying system they've argued for is plausible or not; they claim--quite incorrectly, I think--that the addition of æ to the vowel inventory of English is plausible. Consider now the corresponding problem in the Sanskrit analysis: I have maintained that there are roots ending in the cluster ss. On general grounds, this is an unusual, highly marked cluster (just as æ is an unusual, highly marked vowel). And it is peculiar in Sanskrit (just as æ is peculiar in English, which lacks other front rounded vowels); there are no other clusters of unlike spirants within Sanskrit morphemes. Unless we can in some way explain away the oddness of morpheme-final ss, we will have saved a rule only at the cost of lexical complexity, and our analysis will be no better than SPE's.

The cluster ss would be unsurprising across morpheme boundaries. Could the final s be a separate formative? As it turns out, there are lexical doublets indicating just this analysis. These are bhā- and bhās-, both 'shine'; sru- and sruṣ-, both 'hear'; and hā- 'leave, go forth' as well as hās- 'go'. The case is clinched by a precious pair of doublets in which an alternation between s and ks corresponds to



the absence or presence of final *s* in the other examples: *aś-* with *akṣ-*, and *naś-* with *nakṣ-*, all meaning 'attain'. That is, there is at least one alternating form to support the treatment of surface *kṣ* as underlying /*ś* + *s*/.<sup>7</sup>

There has even been some attempt made to characterize the meaning of the morpheme *-ś*, which survives in Classical Sanskrit only in a handful of frozen forms. Gonda has examined the connection, made in many standard sources on Vedic, between *bhūṣ-* 'adorn, embellish' and *bhū-* 'be, become, thrive'.<sup>8</sup> From a careful survey of the textual evidence he concludes that 'in the main, the meaning of *bhūṣati* is: "to make a person or a thing prosper, to add strength to..., to favour etc."' (Gonda 1959, 87), especially by means of adornments or ceremonies with magic value. He maintains (90) that the *s* had causative meaning and cites *bhīś-* 'frighten, terrify' alongside of *bhī-* 'fear' as well as possible etymologies for *divṣ-* 'hate' and *ukṣ-* '(be) sprinkle' treating them as originally morphologically complex.

### 2.3. The German velar nasal

In the previous section I argued that Sanskrit root-final *kṣ* (alternating with *ṣ*, *ṭ*, *ḍ*, and *k*) should be underlying /*ś* + *s*/, and I claimed that the process of homing in on this remote representation is supported at each step in a way in which the otherwise quite parallel SPE analysis of *ɔj* as /*ɔ̃*/ is not. The generative phonological literature is full of arguments that home in, but not many of these are laid out in as much detail as the example from SPE, or the one I've supplied as a contrast to it. One excellent illustration of the process is the analysis of the German velar nasal by Vennemann (1970), who summarizes his arguments as follows:

In §8 we...found that because of a phonological rule, [ŋ] must be phonologically bisegmental. In §9-11 the conclusion was forced upon us by phonological and morphological evidence that the first of these two segments is a nasal, the second an obstruent. In §12 we were informed by a phonological rule that furthermore...the obstruent must be voiced. The nasal assimilation condition...tells us that this voiced obstruent must be velar. The only phonological voiced velar obstruent of German is /g/...The conclusion is inevitable that [ŋ] (where it is not flanked by a phonetic velar consonant) derives synchronically from /Ng/. (77-8).

### 3. Homing in in syntax

The phonological examples of homing in all involve appeals to simplicity (not necessarily, or even usually, in the technical sense). There would be nothing to discuss if we didn't have to worry about keeping down the number of rules, about the wisdom of positing new underlying elements or combination of them, and the like. In this respect, linguistic homing in is like curve fitting, the choice

of continuous curves to fit finite collections of data; there are certain facts to be accounted for, and there are ways of judging some putative solutions as better or simpler than others (in the case of curve fitting, goodness of fit and simplicity of the function graphed by the curve).

In the Sanskrit example I made use of an implicit appeal to explanation as well, when I pointed out that it is no accident that *kṣ* behaves just like *ś* and *ṣ* before obstruents--that given the alternants before sonorants and in final position and given the fact that Sanskrit has an s-Deletion rule, *kṣ* should have the same reflexes in the remaining environments as the simple spirants have there. My analysis, the argument goes, explains the convergence of forms.

Syntactic applications of homing in tend to emphasize the appeals to simplicity and explanation more than the process of constructing a remote representation bit by bit. The following subsections summarize two fairly transparent instances of homing in from the recent syntactic literature.

### 3.1. Ross' analysis of declaratives

Ross (1970) claims that every declarative sentence has a remote structure in which the content of the surface sentence is dominated by a higher structure with the salient characteristics of the explicitly performative clause

- (1) I declare to you that...

These salient characteristics are at least (a) a first person singular subject, (b) a verb of verbal communication, (c) a second person indirect object, and (d) a direct object with the content of the surface sentence. Ross argues for each of these points individually--proposing to show, for example, that peculiar properties of first person singulars in main declarative sentences reflect peculiar properties of certain embedded noun phrases, namely those dominated by verbs of verbal communication with subjects coreferential to the embedded noun phrases. Thus, the restriction of the reflexive in (2) to the first person singular--compare (3)--reflects a restriction of the embedded reflexive in (4) to pronouns coreferential with the subject of the higher verb; compare (5).

- (2) This is a story about myself.  
 (3) \*This is a story about himself/themselves.  
 (4) He said it was a story about himself.  
 (5) \*He said it was a story about yourself/themselves.

The factual details of Ross' arguments have been much disputed. For my purposes here, I need only point out that his arguments are arranged to home in on a structure like that of (1), and that they can be seen as making an appeal to explanation and to at least two sorts of judgments of simplicity.

The appeal to explanation comes in the attempt to provide a uniform account for two sets of otherwise disparate data, the peculiar properties of first-person singulars in main declarative clauses and the peculiar properties of pronouns in general in certain types of embedded clauses. The argument runs: it is no accident that there is a parallelism between these sets of properties, for there is a single principle encompassing them both, and for an adequate account of these phenomena the parallelism must be made manifest.

The first simplicity judgment refers to the fact that the structure in (1)--or, at the very least, each of its component parts--is independently required in any description of English syntax. The second appeals to the claim that something very much like (1) is independently required as an account of the semantics of declarative sentences. That is, the Ross analysis does not require the postulation of new sorts of structures. The cost of the Ross analysis, on the other hand, comes in the transformational processes that must be assumed to relate (1) to simple declarative sentences.

### 3.2. Geis' analysis of conditionals

Another paradigm example of syntactic homing in can be found in Geis' (1973) treatment of unless and only if. Geis argues that the remote structure of unless is essentially that of in any event other than that and that only if is similarly related to in no event other than that. As part of this demonstration he shows that both types of subordinate clauses<sup>9</sup> have properties like those of clauses headed by event, case, occasion, and the like. He gives evidence as well that unless and only if have properties in common with exclusive constructions, for example those following other than, different from, and except. In addition, he argues that clauses headed by unless behave syntactically like clauses dominated by universal quantifiers (like any), while clauses headed by only if behave syntactically like clauses dominated by negatives.

Again, there is an appeal to explanation--it is no accident that certain constructions share properties with event-clauses, with exclusive constructions, with universal quantifiers, and with negatives. Again also, systematic simplicity can be invoked--the sorts of structures postulated for unless and only if are independently required in an adequate English syntax, or at least their components are, and moreover, something on the order of these structures is needed for an adequate account of the semantics of conditionals.

The central part of Geis' exposition uses the separate instances of shared properties to construct piecemeal a remote representation for the subordinating conjunctions unless and only if. Thereby he homes in on representations like in any event other than that and in no event other than that. Ross uses the same strategy to compose higher sentential structures like I declare to you that. These two articles illustrate nicely the two main lines of inquiry in 'abstract syntax', additional sentential structure (Ross on declaratives) and decomposition of surface lexical units (Geis on conditionals).

### 3.3. Choice problems

In the Geis and Ross examples the representations built up in the process of homing in are substantially similar to rather superficial representations for other constructions. Sometimes this relationship between two classes of representations presents itself as a problem of choice: here are two (or more) types of constructions which are related to each other (they are near or full paraphrases of each other, and perhaps also they are in complementary distribution or serve as stylistic variants); is there a structural relationship between the constructions, and if so, which is more basic, or are both derived from a structure strikingly different from any of the surface realizations?

Quite a few syntactic problems have been treated in the literature as matters of choice--consider the many discussions on the relationship of passive and active sentences in English and other languages and on the underlying structure of sentences with 'psych' verbs, as in (6) through (11).

- (6) I am surprised that Marcus admires Publius.
- (7) It surprises me that Marcus admires Publius.
- (8) It is surprising to me that Marcus admires Publius.
- (9) Marcus surprises me { by admiring Publius  
in that he admires Publius }.
- (10) I am surprised because Marcus admires Publius.
- (11) That Marcus admires Publius causes me to be surprised.

Now it is far from clear that this is the proper way to treat these topics. But even in cases where the simple choice approach has been followed, the analysis proceeds very much as in those of 3.1 and 3.2: it is argued that one of the constructions has a remote structure essentially identical to the surface structure of the other.

More and more, it seems that we need remote representations which incorporate features of each of the surface representations but which are distinct from all of them; or that we need distinct but partially similar representations for the various surface forms. The latter tack is taken, for instance, in recent discussions of the passive by Hasegawa (1968) and Lakoff (1971), who claim that the remote structures associated with active and passive sentences have much in common with each other but are not identical. Such arguments are immensely more complicated than straightforward homing in and therefore lie beyond the scope of this paper.

### 4. On the method

I hope to have demonstrated in the previous sections that homing in is a valid argument form in both phonology and syntax; but that the correctness of the analysis in a particular case depends upon the extent and value of the data, just as the truth of the conclusion of

a syllogism depends on the truth of its premises as well as on the validity of the form. The utility of homing in will also be limited by theoretical considerations; an analyst committed to concrete solutions will reject the method at the point at which it would lead to analyses unacceptable to him. Moreover, as I indicated in discussing the syntactic examples, homing in will be used in combination with other styles and types of argument. What we aim at is, in the words of Francis Bacon, 'a true and lawful marriage between the empirical and the rational faculty'.

#### Footnotes

\*This is a revision of an inaugural lecture at the Ohio State University, November 29, 1971. Other versions have been presented at the University of Massachusetts, Amherst (February 18, 1972) and the Graduate Center of the City University of New York (February 29, 1972). I am indebted to members of these three audiences for many useful criticisms and suggestions; special thanks are due to Gaberell Drachman, Ilse Lehisté, David Stampe, Frank Heny, James Heringer, and D. Terence Langendoen. My thanks to the John Simon Guggenheim Memorial Foundation for its support of this work.

1. Chomsky and Halle (1968). Hereafter SPE.
2. This section is a much revised and expanded treatment of section 4.1 of Zwicky (1965). The transliterations of Sanskrit forms are essentially standard, but do not show the effects of some late sandhi rules (in particular those affecting final s).
3. A few roots in ś (diś- 'point', drś- 'see', spṛś- 'touch', and sometimes naś- 'attain') show k throughout. See Whitney (1960, 74).
4. The segment customarily transliterated as v, whatever its phonetics, functions as a semivowel throughout Sanskrit phonology. See Whitney (1960, 20).
5. (C) might be more general, since there are also cases of s → t. Moreover, it might be possible to combine (B) and (C) into a single despirantization rule.
6. The argumentation concerns root-final ṣ only. It might be possible to support a non-obvious source for the fairly common root-initial cluster kṣ, but the material in this paper doesn't bear on the question.
7. A few roots in kṣ require a different treatment. Thus, jakṣ- 'eat' is probably to be analyzed as jaḡṣ, ultimately as /ja+ḡṣ/, a reduplicated form of ḡṣ- 'eat'; this treatment is supported by the participle jaḡdḡṣa, instead of the expected jaṣṭa or jaḡṣita. Two other roots, mrkṣ- 'stroke' and bhākṣ- 'eat, partake of', have associated forms that suggest underlying /j+s/—respectively, mrj- 'wipe' and bhāj- 'divide, share'. However, there is no evidence from alternations in inflection, because all the attested forms of mrkṣ- and bhākṣ- have a sonorant following the kṣ.
8. I am indebted to Calvert Watkins for calling this article to my attention.

9. Also those introduced by if, which is presumably something on the order of in the event that.

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